

# PATENT SPECIFICATION

**1,141,784**



DRAWINGS ATTACHED

**1,141,784**

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## COMPLETE SPECIFICATION

### Nozzles Capable of having a Silencing Effect

We, SOCIETE NATIONALE D'ETUDE ET DE CONSTRUCTION DE MOTEURS D'AVIATION, a French Body Corporate, of 150, Boulevard Haussmann, Paris 75, France, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

10 This invention relates to a nozzle capable of having a silencing effect, in which the silencing effect is obtained by means of jets of pressurised gas.

15 The nozzle in accordance with the invention comprises a tube open at its rear end, flaps which extend the said tube at its rear end and each of which can pivot about an axis disposed substantially tangential to the said tube and perpendicular to the axis of said tube, an annular main or manifold surrounding the tube, and piping arrangements each of which extends from the manifold, is carried by a flap, terminates at the rear in a pipe directed towards the tube axis and has a flexible section which enables it to follow the pivoting movement of the flap, whereby the silencing effect can be obtained by jets of pressurized gas issuing from the pipes into the main gas flow.

20 30 The accompanying drawing illustrates an embodiment of the nozzle in accordance with the invention, by way of a non-limitative example.

35 In the drawing:

Figure 1 illustrates two side-by-side axial half-sections through the nozzle in accordance with the invention, the two sections showing differing configurations;

40 Figure 2 is an axial section on a larger scale of the free end of a pipe or conduit forming part of the nozzle in accordance with the invention.

45 In Figure 1, X—X is the longitudinal axis of a nozzle. That part of the figure situated above the axis X—X is a schematic, axial,

longitudinal half-section through the nozzle in its normal configuration, i.e. in the condition in which no silencing effect is produced. That part of the figure which is situated below the axis X—X is a schematic, axial, longitudinal half-section through the same nozzle, this time in the configuration in which a silencing effect is produced.

50 In Figure 1, the reference 10 designates a tube which is open at its rear end, i.e. the end situated at the right-hand side of the figure. The flaps 21 extend the tube 10 at its rear end. Each flap can pivot about an axis 22 disposed substantially tangential to the tube 10 and perpendicularly to the axis X—X thereof. Two flaps 21 have been shown in Figure 1. The upper flap is shown in the position which it occupies during normal functioning of the nozzle, that is to say when there is no silencing effect. The lower flap is illustrated in the position which it occupies in order to produce a silencing effect.

55 60 An annular manifold 20 surrounds the tube 10. Piping arrangements 24, each carried by a flap 21, extend from the manifold 20 towards the rear. Each piping arrangement 24 has a flexible section in the form of a bellows 25, adjacent the end of the pipe 10. Due to the provision of this bellows 25, each piping arrangement 24 can follow the movement of the corresponding flap 21.

65 70 75 Each piping arrangement 24 terminates in a pipe or conduit 16 directed towards the axis X—X, the axial, longitudinal section of which is illustrated on an enlarged scale in Figure 2. In the flap position indicated by the lower flap in Figure 1, the silencing effect is obtained by means of pressurised gas jets issuing from the pipes 16 into the main gas flow. It will be seen that the pipe 16 has a convergent-divergent form. Consequently, the velocity of the pressurised gas escaping through this pipe is boosted.

80 85 90 The reference 11 designates a fairing surrounding the nozzle and terminating at a

point 13 to the rear thereof.

**WHAT WE CLAIM IS:—**

1. A nozzle capable of having a silencing effect, comprising a tube open at its rear end, flaps extending the tube at its rear end and each of which is pivotable about an axis substantially tangential to the tube and perpendicular to the axis of the tube, an annular main or manifold surrounding the tube, and piping arrangements each extending from the manifold, being carried by a flap, terminating at the rear in a pipe directed towards the tube axis, and having a flexible section enabling it to follow the movement of the flap, whereby the silencing effect can be obtained by jets of pressurised gas issuing from the pipes into the main gas flow.
2. A nozzle according to claim 1, in which the flexible section is constituted by a bellows

situated adjacent the end of the tube extended by the flaps. 20

3. A nozzle according to claim 1 or claim 2, in which a fairing surrounds the nozzle.
4. A nozzle according to claim 3, in which the fairing extends towards the rear beyond the nozzle. 25

5. A nozzle according to any one of claims 1 to 4, in which the pipe has a convergent-divergent form.

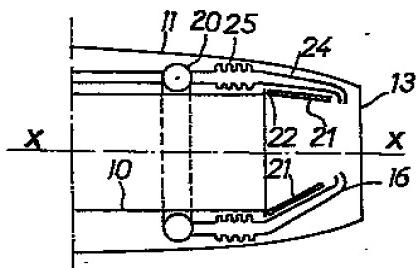
6. A nozzle having silencing means substantially as hereinbefore described with reference to the accompanying drawings 30

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1 SHEET      *This drawing is a reproduction of  
the Original on a reduced scale.*

*Fig.1*



*Fig.2*

